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| 09/960,545 | 09/21/2001 | Deep K. Buch | 42390P11711 | 5908 |

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| EXAMINER | |
|---|---|
| OPIE, GEORGE L | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2194 | |

DATE MAILED: 05/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/960,545 | Deep Buch | |
| | Examiner | Art Unit | |
| | George L. Opie | 2151 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

**Status**

1) X Responsive to communication(s) filed on 20 January 2005 .

2a) X This action is **FINAL**. 2b) ___ This action is non-final.

3) ___ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) X Claim(s) 1-30 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ___ Claim(s) _____ is/are allowed.

6) X Claim(s) 1-30 is/are rejected.

7) ___ Claim(s) _____ is/are objected to.

8) ___ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9) ___ The specification is objected to by the Examiner.

10) ___ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ___ The proposed drawing correction filed on _____ is: a) ___ approved b) ___ disapproved.

12) ___ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

13)_ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ___ All b) ___ Some * c) ___ None of the CERTIFIED copies of the priority documents have been:

1. ___ received.
2. ___ received in Application No. (Series Code / Serial Number) _____.
3. ___ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) ___ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

**Attachment(s)**

14) ___ Notice of References Cited (PTO-892)
15) ___ Notice of Draftsperson's Patent Drawing Review (PTO-948)
16) ___ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
17) ___ Interview Summary (PTO-413) Paper No(s). _____.
18) ___ Notice of Informal Patent Application (PTO-152)
19) ___ Other:

## DETAILED ACTION

This Office Action is responsive to the Amendment dated 20 January 2005, in which claims 1, 11 and 18-30 were amended.

The Office acknowledges Applicant's inclusion of an electronic copy of the amendment on a 3½inch floppy disk, and the Office would like to thank Applicant for submitting the amendment in electronic form to expedite its processing.

1. Claim Rejections - 35 U.S.C. § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Admitted Prior Art (APA) from the Application background in view of Orton et al. (U.S. Patent 6,351,778).

As to claim 1, the APA teaches a method (algorithm to ensure mutually exclusive access to a shared resource) comprising:
for a first thread, entering a processing queue for obtaining permission to enter a critical section of code (thread I ... critical section ... enters the processing queue)
determining if a second thread exists, the second thread executing the critical section of code concurrently with the first thread entering the processing queue (condition test ... thread j is currently executing) and
if the second thread is executing the critical section, then testing for the second thread to complete (second condition ... if thread j has completed) until one of the following occurrences:
the second thread completes (line 10 ... thread j completes).
The APA does not explicitly disclose the additional testing condition – a yielding count.

Orton teaches "time-outs can also be set on the condition wait operations to limit the time a thread will wait for the condition", p19 10-12 which corresponds to the limitation of a yielding count to terminate the testing. It would have been obvious

to combine Orton's time-out teachings with the APA because this mechanism provides threads a means to "limit the time spent waiting", p30 24-51 on the desired object, and thus each of the processes in the system would have a guard against an unbounded idle/wait state.

As to claim 2, Orton (p19 10-12) teaches the mechanism will "limit the time a thread will wait", and from this it would naturally follow that the thread will then exit the processing queue.

As to claims 3-4, Orton teaches that the system has means for thread resumption, p13 28-49, and from this, it would have been obvious to specify that the OS will schedule an expired thread to resume its processing. It would have been obvious to combine Orton's teachings with the APA because a thread that has yielded its position in the queue without being processed can be identified so that it avoids starvation and is "caused to resume execution with an indication" of its requirements.

As to claim 5, the APA teaches if the second thread completes before the yielding count expires, then executing the first critical section of code (thread I will be executed if ... second condition ... thread j has completed).

As to claim 6, the APA teaches if the second thread does not exist, then executing the first critical section of code (first condition ... thread I is the only thread running).

As to claims 7-9, Orton (p30 24-51) teaches a "time-out value can be specified" and this limit would be based on the parameters as recited. It would have been obvious to combine Orton's teachings with the APA because the wait/yield time will factor the number of processes in relation to the system processors for determining optimal timing-bounds based on system conditions/resources.

As to claim 10, the APA teaches the concept of two processes each contain a "section of code in which a shared resource is accessed" which corresponds to the critical section of code includes the same code in both the first and the second thread.

As to claim 11, the APA teaches a method (algorithm to ensure mutually exclusive access to a shared resource) comprising:
for a first thread, entering a processing queue for obtaining a lock on a shared resource in a first critical section of code (thread I ... critical section ... enters the processing queue) by checking the status of shared variables existing in a memory (conditions and flag variables) the shared variables including a status flag; determining if a second thread exists, the second thread executing a second critical section of code concurrently with the first thread entering the processing

queue, the second critical section corresponding to the second thread (condition test ... thread j is currently executing) and
if the second thread exists, then testing for the second thread to relinquish the lock on the shared resource by testing the status flag (second condition ... if thread j has completed) the testing to be performed until one of the following occurrences:
The APA does not explicitly disclose the additional testing condition – a yielding count.

Orton teaches "time-outs can also be set on the condition wait operations to limit the time a thread will wait for the condition", p19 10-12 which corresponds to the limitation of a yielding count to terminate the testing. It would have been obvious to combine Orton's time-out teachings with the APA because this mechanism provides threads a means to "limit the time spent waiting", p30 24-51 on the desired object, and thus each of the processes in the system would have a guard against an unbounded idle/wait state.

As to claim 12, see the rejection of claim 5 supra.

As to claims 13-14, see the rejections of claims 2-3 respectively.

As to claim 15, note the discussion of claim 11 supra. The limitations in claim 15 are functionally equivalent to the limitations in claim 11, but for the repetition clause which is met by the APA's "while-loop" taught in the Peterson algorithm.

As to claim 16, Orton (p25 14-39) teaches the second cache is larger than the first cache. It would have been an obvious design choice to add the well-known cache provisions to the APA's system because cache memories furnish fast access to data, and the size is determined on a cost/benefit basis.

As to claim 17, the APA teaches "thread j resets the flag variable".

As to claims 18-19, note the rejections of claims 1-2 above. Claims 18-19 are the same as claims 1-2, except claims 18-19 are computer program product claims and claims 1-2 are method claims.

As to claim 20, note the rejection of claim 6 above. Claim 20 is the same as claim 6, except claim 20 is a computer program product claim and claim 6 is a method claim.

As to claims 21-22, note the rejections of claims 1-2 above. Claims 21-22 are the same as claims 1-2, except claims 21-22 are apparatus claims and claims 1-2 are method claims.

As to claim 23, note the rejection of claim 6 above. Claim 23 is the same as claim 6, except claim 23 is a apparatus claim and claim 6 is a method claim.

As to claims 24-30, see the discussions of claims 1-7 supra. Claims 24-30 are functionally equivalent to claims 1-7, except claims 24-30 are apparatus claims and claims 1-7 are method claims.

3. The prior art of record and not relied upon is considered pertinent to the applicant's disclosure. Specifically, the below reference(s) will also have relevancy to one or more elements of the Applicant's claimed invention as follows:
U.S. Patent No. 6,766,349 to Belkin which teaches the maximum time out condition to govern thread processing;
U.S. Patent No. 5,781,775 to Ueno which teaches the deactivation of a waiting process and re-initiating its execution.

**4. Response to Applicant's Arguments:**

Applicant argues (claim 1) that Orton's teachings do not meet the yielding count as a condition for termination. Contrary to Applicant's contention, the Orton reference does teach "time-outs" equivalent to the yielding count as claimed. Orton's time-out mechanism provides the means for terminating the specified thread operations. Commensurate with the claimed "yielding count" that functions to limit the given procedure, Orton's prior art time-out device does signal a thread to terminate its request, process or test when the time/count expires .

The scope of the claimed "yielding count" clearly transcends the more narrow scope that Applicant attempts to impute through argument. Claimed subject matter, not the specification is the measure of the invention. Limitations in the specification cannot be read into the claims for the purpose of avoiding the prior art, In re Self, 213 USPQ 1 (CCPA 1982); In re Priest, 199 USPQ 11 (1978). The recited thread execution and control elements are clearly subject to a broad interpretation, as detailed in the rejections maintained above. The Examiner has a *duty* and *responsibility* to the public and to Applicant to interpret the claims *as broadly as reasonably possible* during prosecution. *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969)

During patent examination, the pending claims must be "given their broadest reasonable interpretation consistent with the specification." *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000). Applicant always has the opportunity to amend the claims during prosecution, and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969)
*See also In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (1989) "During patent examination the pending claims must be interpreted as broadly as

their terms reasonably allow.... The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed.... An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process.".

In considering the count term for governing thread processes, it is noted that Applicant uses terminology that has broad meaning in the art, and thus requires a broad interpretation of the claims in determining patentability of the disclosed invention. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Applicant should set forth claims in language that clearly, distinctly, unambiguously and uniquely define the invention. The fact that Applicant has not narrowed the definition/scope of the current claims implies that Applicant intends an extensive coverage breadth of the claims, which is clearly met by the cited prior art.

Limitations appearing in the specification but not recited in the claim are not read into the claim. *E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1369, 67 USPQ2d 1947, 1950 (Fed. Cir.. 2003). claims must be interpreted "in view of the specification" without importing limitations from the specification into the claims unnecessarily. (see *Prater supra at 1404-05, 550-551).*

Applicant also asserts that "there is no motivation to combine the 'time-outs' of Orton with the APA in such a way as to produce yield counts functioning as they do in the present application."
In response, Examiner notes that the test for the relevance of a cited combination of references is: "whether the teachings of the prior art, taken as a whole, would have made obvious the claimed invention," *In re Gorman*, 933 F.2d at 986, 18 USPQ2d at 1888. Subject matter is unpatentable under section 103 if it 'would have been obvious ... to a person having ordinary skill in the art.' While there must be some teaching, reason, suggestion, or motivation to combine existing elements to produce the claimed device, it is not necessary that the cited references or prior art specifically suggest making the combination: *In re Nilssen*, 851 F.2d 1401, 1403, 7 USPQ2d 1500, 1502 (Fed. Cir. 1988)." Such suggestion or motivation to combine prior art teachings can derive solely from the existence of a teaching, which one of ordinary skill in the art would be presumed to know, and the use of that teaching to solve the same [or] similar problem which it addresses. *In re Wood*, 599 F.2d 1032, 1037, 202 USPQ 171, 174 (CCPA 1979). "In sum, it is off the mark for litigants to argue, as many do, that an invention cannot be held to have been obvious unless a suggestion to combine prior art teachings is found in a specific reference." *In re Oetiker*, 24 USPQ2d 1443 (CAFC 1992). Considering the prior art in this case, Orton and

the APA, it is clear that each reference is directed to controlling/coordinating access to shared resources, and the cited teachings respectively dovetail to congruously cover the claim elements as identified in the above rejections.

The thread/resource management, in the manner recited in the pending claims does not constitute a non obvious improvement over the prior art.

Applicant's arguments have been fully considered but are deemed to be unpersuasive. For the reasons detailed above, the obviousness rejections are maintained in accordance with 35 U.S.C. § 103 as set forth supra.

The Office acknowledges Applicant's inclusion of an electronic copy of the amendment on a 3½inch floppy disk, and the Office would like to thank Applicant for submitting the amendment in electronic form to expedite its processing.

5. THIS ACTION IS MADE FINAL.

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

**6. Request for copy of Applicant's response on floppy disk:**
Please help expedite the prosecution of this application by including, along with your amendment response in paper form, an electronic file copy in WordPerfect, Microsoft Word, or in ASCII text format on a 3½ inch IBM format floppy disk. Please include all pending claims along with your responsive remarks. Only the paper copy will be entered -- your floppy disk file will be considered a duplicate copy. Signatures are not required on the disk copy. The floppy disk copy is not mandatory; however, it will help expedite the processing of your application. Your cooperation is appreciated.

**7. Contact Information:**
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system.

Status information for published applications may be obtained from either Private-PAIR or Public-PAIR.

Status information for unpublished applications is available through Private-PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

All responses sent by U.S. Mail should be mailed to:

**Commissioner for Patents**
**PO Box 1450**
**Alexandria, VA 22313-1450**

Hand carried responses should be delivered to the *Customer Service Window* (Randolph Building, 401 Dulany Street, Alexandria, Virginia 22314) and, if submitting an electronic copy on floppy or CD, to expedite its processing, please notify the below identified examiner prior to delivery, so that the Applicant can "handoff" the electronic copy directly to the examiner.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist at **(571) 272-2100.**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Opie at (571) 272-3766 or via e-mail at *George.Opie@uspto.gov*. Internet e-mail should not be used where sensitive data will be exchanged or where there exists a possibility that sensitive data could be identified unless there is an express waiver of the confidentiality requirements under 35 U.S.C. 122 by the Applicant. Sensitive data includes confidential information related to patent applications.

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